D. Transfer of Control and Assignment of Licenses

CellularVision supports the Commission's decision in paragraph 108 to withdraw its earlier proposal to limit the transfer or assignment of LMDS licenses. CellularVision is a strong proponent of the Commission's policy of promoting vigorous competition in the video and telephony marketplaces. To that end, true market forces, rather than artificial regulatory mechanisms, should serve to shape the competitive balance of the communications marketplace.

However, CellularVision is also mindful of the Commission's goal in the broadband PCS and Specialized Mobile Radio contexts of ensuring that a variety of applicants, in particular designated entities such as small businesses, are given an opportunity to provide new and innovative communications services.[28] Therefore, to ensure that entities do not take advantage of bidding in the proposed LMDS auctions and immediately transfer their licenses to other entities, thus unjustly enriching auction winners and not the licensees who would otherwise provide competitive services, CellularVision supports the Commission's proposal to impose certain restrictions on the transfer of licenses held by designated entities.

E. LMDS Services and Regulation

In the Third NPRM, in paragraphs 94-96, the Commission requests comment on

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[28] See Implementation of Section 309(j) of the Communications Act — Competitive Bidding, Fifth Report and Order, 9 FCC Rcd 5532, paras. 93-96 (1994); see Amendment of Parts 2 and 90 of the Commission's Rules to Provide for the Use of 200 Channels, Second Report and Order and Second Further Notice of Proposed Rulemaking, 10 FCC Rcd 6884 (1995).

three different approaches for regulating LMDS licensees. As the Commission has noted, LMDS offers the promise of a wide array of communications services, from two-way voice and data to two-way interactive video distribution — all of which can be varied on a cell-by-cell basis. The Commission must be vigilant not to impose overly burdensome and unnecessary regulatory requirements on this new service, such as a presumption that LMDS licensees operate as common carriers. Rather, CellularVision urges the Commission to adopt a regulatory approach which maximizes an LMDS licensee's flexibility in offering the competitive video and telephony services contemplated by the Commission without unnecessary regulatory rigidity.

Accordingly, CellularVision supports the Commission's second option, set forth in paragraph 95, whereby a licensee could choose to offer its services either as a private carrier or as a common carrier.[29] Such flexibility will optimize the ability of LMDS operators to serve consumers based on the needs of the marketplace. In this context, in allowing LMDS operators the flexibility to choose their regulatory status, CellularVision urges the Commission to adopt a framework that presumes private carrier status.[30] Moreover, given LMDS's unique cell-based architecture which allows operators to target services which address the particular needs and demographics of subscribers within each cell, the Commission should also allow LMDS providers to elect between private carrier or common carrier status on a cell-by-cell basis, or within

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[29] CellularVision supported a similar proposal in response to the First NPRM in this proceeding. See Suite 12 Group Comments in CC Docket No. 92-297, March 16, 1993, p. 25.

[30] See id.

a cell on a service-by-service basis.

F. Regulation of Common Carriers/Preemption

CellularVision supports the Commission's tentative conclusion in the First NPRM and again in the Third NPRM in paragraph 112 that state regulation of private carrier LMDS video distribution should be preempted. As CellularVision argued in response to the First NRPM in this proceeding, such services are inherently interstate in nature, and local and state regulation could impede the prompt deployment of LMDS nationwide, stifling the immediate deployment of LMDS as a commercially viable competitor to the cable.[31] With regard to preemption of state regulation of common carrier LMDS services, at this time CellularVision agrees with the Commission's conclusion in the Third NPRM in paragraph 112 to defer consideration of such issues until they arise.

G. Construction Requirements

CellularVision agrees with the Commission's tentative conclusion in paragraph 117 that some build-out requirement is necessary for LMDS, but one which is more moderate than the Commission's proposal in the First NPRM. As the Commission recognizes, in response to the First NPRM most parties commented that the build-out requirements proposed by the Commission were too stringent. CellularVision believes that the build-out requirements proposed by the Commission in the Third NPRM,

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[31] See id., p. 32.

namely that LMDS licensees make service available to a minimum of one-third of the population of their geographic service areas within five years from license grant, and two-thirds within ten years from grant, is much more realistic and feasible. In terms of measuring compliance with the one-third and two-thirds thresholds, CellularVision suggests that compliance be based on LMDS cell coverage, i.e. population residing within LMDS cell boundaries.[32]

H. Technical Rules

1. Frequency Coordination

CellularVision supports the Commission's tentative conclusion in paragraph 118 that the Commission need only adopt standards that will facilitate coordination between geographically adjacent LMDS systems and between LMDS and MSS feeder link facilities where they share spectrum. It is clear that each licensee will need to coordinate its operation with other entities licensed to provide service in geographically adjacent service areas.

CellularVision concurs with the Commission's view discussed in paragraph 119 that each licensee should have control over its own facilities within its designated service area and be responsible for minimum service performance standards and interference levels within its system. Competitive forces will compel LMDS operators

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[32] As LMDS is a new, exciting pro-competitive technology that is ready to be deployed nationwide immediately, CellularVision suggests that the Commission be flexible in considering innovative approaches in the application and licensing process that, while providing adequate protection to LMDS licensees in adjacent service areas, will avoid unnecessary delay in the deployment of LMDS.

to maximize service performance standards and minimize interference levels within their systems in the absence of a detailed prescription of technical service rules regarding limits on EIRP, power flux densities, system frequency stabilities, or spectral efficiencies of modulation schemes. As the Commission has acknowledged, LMDS services are likely to evolve toward a wide array of service types and approaches, to the benefit of the consumer. Definition of detailed technical service rules would only serve to retard the development of desirable alternatives from a market standpoint.

CellularVision supports the Commission's proposal in paragraph 120 to require LMDS licensees to coordinate with each other to avoid interference at service boundaries. CellularVision agrees that this process, without imposing the requirement that any particular methods be used to accomplish interference mitigation, will be efficient and provide LMDS operators with the necessary system engineering flexibility.

However, it is neither necessary nor appropriate to set a maximum power flux density (PFD) level at the service area boundaries at this time. The intrinsic nature of LMDS systems, given their ability to re-use frequency in every cell, accomplishes a minimization of interference at cell boundaries independent of whether they are within a single operator's service area or at the boundary of two operators' service areas. Interference at a service area boundary to a given operator which does not experience unacceptable interference within its own service area would serve as a clear indication that modifications would be required to the design of the interfering system.

LMDS subscriber stations will employ highly directional antennas. These

antennas provide a far more effective means for isolation and interference rejection at service area boundaries than a PFD limit. Moreover, while the intrinsic nature of LMDS systems accomplishes a minimization of interference, several different LMDS system designs have been proposed and others may evolve. A PFD limit that protects one design against interference may not be sufficient to protect another. Thus, coordination between system operators is the preferred approach to interference mitigation at service area boundaries.

Further, adoption of PFD limits now would be inefficient and premature given that a particular proposed design may never be used. Consequently, PFD limits should be considered only after LMDS designs have matured, systems have been deployed and the coordination between operators at service area boundaries has been employed as an interference mitigation technique.

Additionally, because of the population density distribution of the typical BTA, population densities at the BTA boundary areas are expected to be lower than population densities within the BTA taken as a whole. This factor itself decreases the likelihood that any unacceptable interference would occur at service area boundaries. LMDS operators should have the flexibility to negotiate with each other and to employ the interference mitigation methods that are best suited to the area.

CellularVision supports the Commission's view discussed in paragraph 121 that the exclusive use of linear, orthogonally polarized signals in LMDS is desirable and further supports a requirement that linear, orthogonally polarized signals be employed by LMDS systems. This simple system design criterion provides generous levels of

isolation between systems and cells which can serve to mitigate any interference at service area boundaries with proper coordination and, as the Commission accurately has observed, may ultimately be a critical component of co-frequency sharing between LMDS and satellite systems. CellularVision's support for exclusive use of orthogonally polarized signals is driven by its critical role in allowing co-frequency sharing, whether the co-frequency sharing is on a co-primary or primary-secondary basis; both have been proposed by the Commission in various parts of the band under consideration in the Third NPRM.

Moreover, since the primary driver for mandating exclusive use of linear, orthogonally polarized signals for LMDS is the contribution to co-frequency sharing, it should be required throughout the service area as opposed to only at the service area boundaries. Satellite receivers will be affected by emissions in the interior of the LMDS service areas as well as emissions at the service area boundaries.

2. Equivalent Isotropically Radiated Power ("EIRP")

In paragraph 123 the Commission has proposed to limit LMDS transmitter EIRP to -52 dBW/Hz rather than to -18 dBW/Hz (based on a bandwidth of 20 MHz) that is the maximum EIRP in the 28 GHz band under current Commission rules for point-to-point links. The Commission has proposed that the -18 dBW/Hz EIRP limit would continue to be applied to intercell connecting links in the LMDS (i.e., LMDS "feeder links"). CellularVision supports this proposal, and further supports the 20 MHz measurement bandwidth — the EIRP of intercell links measured in any 20 MHz

bandwidth should not exceed -18 dBW/Hz.

However, CellularVision does not support the Commission's proposed EIRP limit of -52 dBW/Hz for other LMDS transmitters (hubs, subscribers). As is the case with any proposed PFD limits, the adoption of any EIRP limit would be inefficient and premature. The proposed limit would restrict the flexibility of LMDS designs. Many LMDS designs have been proposed and others may evolve which meet interference mitigation requirements but depend on EIRP levels above the -52 dBW/Hz limit. Further, service area boundary interference mitigation techniques employed by LMDS operators in the proposed coordination process may mandate the use of directional antennas which increase EIRP and concurrently suppress undesired interference. Today's technology supports EIRP levels far above -52 dBW/Hz. As competitive forces drive LMDS operators toward higher-level modulation schemes, increasing the spectral efficiency of the systems (bits per second per unit bandwidth), the trend toward higher, not lower, EIRPs per unit bandwidth will emerge.

CellularVision does not support the Commission's proposed EIRP limit of -52 dBW/Hz for LMDS transmitters. Imposing any limits outside the bands proposed for co-primary use of LMDS and MSS feeder links is unnecessarily constraining. CellularVision does not believe that this limit provides LMDS system operators with sufficient flexibility and adequate power to meet their needs which include, among other needs, compliance with build-out requirements separately proposed in the Third NPRM and the need to maintain flexibility to offer competitive, two-way telephony and data services.

3. Spectral Efficiency and Frequency Tolerance

Initially, CellularVision questions whether any "spectral efficiency" regulations whatsoever are needed for spectrum that is licensed by competitive bidding. These "spectral efficiency" regulations would include frequency tolerance or modulation spectral efficiency requirements. Greater spectral efficiency is always achievable using more complex and expensive equipment. In establishing new services in the past, the Commission has imposed its judgment as to the proper tradeoff between spectral efficiency and equipment cost and complexity. In making this judgment, the Commission has often had to ease technical rules in response to later petitions claiming that the rules were too stringent.[33] When spectrum is auctioned to establish new services, the licensees have the economic incentive to make the needed optimal tradeoff between equipment cost and spectral efficiency. There is no need for any modulation spectral efficiency or frequency tolerance regulation in such a case.

While CellularVision applauds the Commission's desire to maximize use of the 28 GHz spectrum, CellularVision does not support the Commission's proposal in paragraph 123 to adopt a 0.001% frequency tolerance for LMDS equipment. The Commission's rationale for the frequency tolerance proposal is that such a tolerance "will maximize the use of this spectrum" and that it "can be achieved without significant costs."[34] While such a requirement may be technically appropriate for hub

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[33] See e.g. Memorandum Opinion and Order in CC Docket No. 86-383, 2 FCC Rcd 3164 (1987) (modifying the DTS emission mask).

[34] Third NPRM, para. 124.

transmitters, it is not appropriate for subscriber stations.

Even if the Commission should decide to impose a 0.001% stability requirement on LMDS hubs, it must not impose this requirement on LMDS subscriber stations. LMDS subscriber stations must be designed with low cost as the critical requirement. While, as the Commission has observed in paragraph 123, the proposed 0.001% frequency tolerance is "within the current state-of-the-art," it cannot be achieved at the necessary low cost for LMDS subscriber equipment. Further, LMDS subscriber stations will be designed to operate at much lower power levels than hub stations. The Commission has traditionally permitted lower power stations to employ a lower frequency stability.[35] CellularVision proposes that the Commission exempt LMDS subscriber stations with per-carrier transmitter output power below 500 mW from any frequency stability requirements, or in the alternative, retain the current Part 21 requirement of 0.03% for subscriber stations.[36]

In paragraph 124 the Commission seeks comment on whether there is a need for a measure of modulation spectral efficiency, and asks whether meeting a 1.0 bps/Hz spectral efficiency for digital modulated systems would present any problems to equipment manufacturers. CellularVision believes that no such requirement is appropriate for LMDS. As noted above, because of the competitive bidding process

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[35] See e.g. Sections 94.90 and 94.91 of the Commission's Rules (which permit low power transmitters to employ lower stability — 0.01% at 12 GHz, 0.05% stability at 23 GHz); see also Section 74.655(b) of the Rules (transmitters below 250 mW output power exempt from equipment authorization), and Section 74.661 of the Rules (0.05% stability for transmitters below 50 mW output power at 38 GHz).

[36] See 47 C.F.R. § 21.101 (1994).

that will be used to award LMDS licenses, winning bidders can be relied on to employ the appropriate type of digital modulation for services that require it. Furthermore, the multiple access schemes and frequency re-use efficiency of LMDS (frequency re-use in every cell) are much more significant factors in considering the overall "spectral efficiency" of LMDS than is the modulation efficiency.

LMDS systems will require complex network design decisions that involve tradeoffs between the choice of a digital modulation, multiple access technique, and equipment cost. These decisions can best be made by the licensee, in order to maximize the return on the investment in spectrum. Moreover, a 1.0 bps/Hz limit would appear to prohibit use of direct sequence or other spread spectrum transmission techniques, which could play an important role in LMDS communications.

Although the Commission correctly notes in paragraph 124 that the 1.0 bps/Hz standard was adopted many years ago, and further that "over the years advanced modulation techniques have been developed and will continue to do so," any spectral efficiency requirement based on a measure of bps/Hz could stifle the development of lowest-possible-cost LMDS implementations. Wireless transmission by LMDS will be limited to "near constant envelope" modulation techniques such as QPSK if economically practical designs are to be employed in the LMDS. Higher order modulations, while more spectrally efficient, also require more peak power and a higher peak-to-average power ratio in the transmitter than the state-of-the-art power transmitter sources available for LMDS can provide without critical degradation by intermodulation distortion.

If the Commission insists on a spectral efficiency standard for LMDS, it must account for the frequency re-use efficiency of the LMDS system designs. With all other factors being equal, an LMDS design that reuses all frequencies in each cell is twice as "spectrally efficient" as an LMDS design that reuses frequencies in only half the cells. Furthermore, the spectral efficiency of LMDS, when measured against the satellite system designs proposed for the 28 GHz band (such as Teledesic and Hughes Spaceway) from the standpoint of frequency re-use efficiency, shows a clear advantage for LMDS that cannot be overcome by the satellite systems. LMDS, with typical 52 square mile cells, can reuse its allocated spectrum more than 57,000 times in the continental U.S. By contrast, Hughes Spaceway would reuse its spectrum a total of 24 times in the continental U.S., and Teledesic would reuse spectrum "at least" 350 times in the continental U.S. Thus, the advantage for LMDS is 2,375 to one against Hughes Spaceway and 163 to one against Teledesic in frequency re-use efficiency.

CellularVision believes that the efficiency standards adopted by the Commission for the Private Land Mobile Radio Services ("PLMRS") refarming efforts noted in paragraph 124 would not be appropriate for LMDS. These standards, which mandate a minimum modulation efficiency standard of 0.768 bps/Hz, were not developed for the LMDS system architectures. Unlike the PLMRS, which generally employ frequency only once in a metropolitan area, LMDS will support many separate re-uses of a channel within a metropolitan area. With equal modulation efficiency, LMDS could then have a "spectral efficiency" measured over a metropolitan service area that is

thirty, forty, or fifty or more times that of the PLMRS. For these reasons, the adoption of any simple "spectral efficiency" standard for LMDS based on bps/Hz is inappropriate. Rather, one that characterizes the true efficiency with which the precious spectrum resource is used by LMDS is preferred if any spectral efficiency standard is needed at all.

IV. Competitive Bidding Procedures

Throughout the duration of the protracted 28 GHz LMDS Rulemaking proceeding, CellularVision has been a staunch advocate of a mechanism for licensing both LMDS and satellite services that would generate important deficit-reducing dollars for the U.S. Treasury. To that end, CellularVision unequivocally supports the Commission's tentative conclusion in paragraph 132 to use competitive bidding procedures to award both LMDS and satellite licenses. In addition, CellularVision generally supports the specific auction rules proposed by the Commission, which largely mirror those rules painstakingly crafted by the Commission and supported by voluminous record in the Broadband and Narrowband Personal Communications Service rulemakings. However, some inherent differences between PCS and LMDS may warrant modifications to certain of those rules in the LMDS context.

As stated above, CellularVision prefers that the Commission license one LMDS operator per service area with 1000 MHz of spectrum, from 27.5-28.35 GHz and 29.1-29.25 GHz. However, to the extent that the Commission divides that 1000 MHz into multiple licenses per service area, CellularVision would urge the Commission to

do so only if it permits all licenses within a service area to be aggregated by a single entity. Either through the award of a single 1000 MHz per service area or alternatively through the award of multiple licenses subject to aggregation, an LMDS provider must have the ability to operate a video, voice and/or data system with 1000 MHz capacity in order to have sufficient spectrum to provide natural and viable competition to incumbent cable and telephony incumbent service providers — thus promoting consumer choice and the Commission's important goal in the 28 GHz Rulemaking proceeding of facilitating the entry of multiple providers of innovative communications into the marketplace.[37] While CellularVision would prefer the Commission to issue one 1000 MHz LMDS license per service area, if the Commission does not award one LMDS license per service area, but decides to award multiple licenses subject to aggregation of the full 1000 MHz by a single entity in a given service area, the Commission's auction rules must include specific procedures to permit such aggregation.

CellularVision supports the Commission's proposal in paragraph 167 to require participants in LMDS and FSS auctions to tender a substantial upfront payment in advance of the auction, as this should ensure that the process of licensing LMDS nationwide is not encumbered by frivolous bidders. In seeking comment on the appropriate upfront payment price per MHz-pop for LMDS and satellite licenses, the Commission notes that its $0.02 per pop per MHz formula used in the PCS context was designed to represent approximately five percent of the expected value of such

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[37] See Third NPRM, para. 2.

licenses. However, since a 1000 MHz LMDS license would represent approximately 33 times more spectrum than the largest PCS license, the PCS upfront payment formula is excessive for LMDS. For example, at $0.02 per pop per MHz, the upfront payment for a BTA with one million pops would be $20 million; for the whole country, the upfront payment would be $5 billion. Clearly, a formula far lower than the $0.02 per pop per MHz used for PCS is appropriate for LMDS.

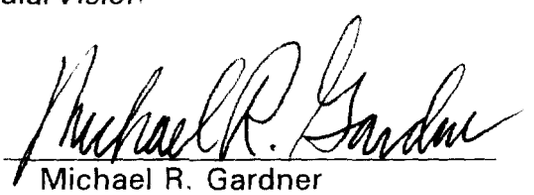
V. Conclusion

CellularVision strongly supports the Commission's efforts to bring this protracted rulemaking proceeding to a prompt resolution in a manner that will foster the deployment of LMDS systems nationwide to the benefit of consumers throughout the country. CellularVision agrees with the Commission's vision of LMDS as a viable competitor in cable and telephony industries, and urges the Commission to develop a flexible regulatory framework for LMDS which enhances the ability of LMDS operators to compete in these entrenched markets. CellularVision supports the Commission's proposed band segmentation plan for the 28 GHz band, as well as the Commission's proposals to grant CellularVision a pioneer's preference and to renew and grandfather CellularVision's existing commercial license for the New York PMSA. CellularVision respectfully requests that the Commission adopt rules in this proceeding consistent with the positions discussed above, and to proceed with LMDS spectrum

auctions and licensing as promptly as possible.

Respectfully submitted,

CellularVision

By: 

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